

Entropy Worksheet

Indicate the sign of ΔS for the following processes.

$\text{CaO(s)} + \text{CO}_2\text{(g)} \rightarrow \text{CaCO}_3\text{(s)}$	ΔS _____
$\text{HCl(g)} + \text{NH}_3\text{(s)} \rightarrow \text{NH}_4\text{Cl(s)}$	_____
$\text{N}_2\text{(g)} + \text{O}_2\text{(g)} \rightarrow 2\text{NO}_2\text{(g)}$	_____
$\text{FeCl}_2\text{(s)} + \text{H}_2\text{(g)} \rightarrow \text{Fe(s)} + 2\text{HCl(g)}$	_____
The reaction between zinc and hydrochloric acid	_____
Silver nitrate combining with potassium bromide	_____
Decomposition of lithium chloride	_____

Which substance possesses the most entropy?

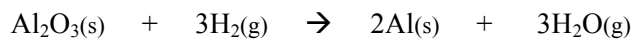
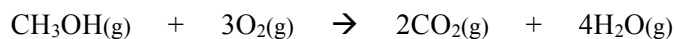
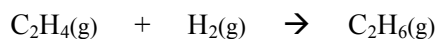
1 mol of $\text{P}_4\text{(g)}$ at 300°C , 0.01 atm **or** 1 mol of $\text{As}_4\text{(g)}$ at 300°C , 0.01 atm

He(g) at 3 atm pressure **or** He(g) at 1.5 atm pressure

0.5 mol of $\text{N}_2\text{(g)}$ at 298 K and 20 L volume **or** 0.5 mol $\text{CH}_4\text{(g)}$ at 298 K and 20 L volume

100 g of $\text{Na}_2\text{SO}_4\text{(s)}$ at 30°C **or** 100 g of $\text{Na}_2\text{SO}_4\text{(aq)}$ at 30°C

Calculate the ΔS° using standard entropy values from the tables in the back of the text. In each case explain the sign of ΔS° .



Explain why the hydroxide ion has a ΔS° of $-10.7 \text{ J}/(\text{mol}\cdot\text{K})$